

What Is Claimed Is:

1. A tunable Fabry-Perot filter comprising:

a bottom mirror mounted to the top of a substrate;

5 a bottom electrode mounted to the top of said
bottom mirror;

a thin membrane support atop said bottom
electrode;

10 a top electrode fixed to the underside of said
thin membrane support;

a reinforcer fixed to the outside perimeter of
said thin membrane support; and

15 a confocal top mirror set atop said thin membrane
support, with an air cavity being formed between said
bottom mirror and said top mirror;

wherein said top electrode and said bottom
electrode are spaced further apart from one another
than said top mirror is spaced from said bottom mirror.

20 2. A tunable Fabry-Perot filter according to
claim 1 wherein said top electrode is spaced further
from said substrate than said top mirror is spaced from
said substrate.

3. A tunable Fabry-Perot filter according to claim 1 wherein the top surface of said bottom mirror is located further from said substrate than the top surface of said bottom electrode.

4. A tunable laser comprising:
a bottom mirror mounted to the top of a substrate;
a gain region mounted to the top of said bottom mirror;
a bottom electrode mounted to the top of said gain region;
a thin membrane support atop said bottom electrode;
a top electrode fixed to the underside of said thin membrane support;
a reinforcer fixed to the outside perimeter of said thin membrane support; and
a confocal top mirror set atop said thin membrane support, with an air cavity being formed between said bottom mirror and said top mirror,

wherein said top electrode and said bottom electrode are spaced further apart from one another than said top mirror is spaced from said bottom mirror.

5 5. A tunable laser according to claim 4 wherein said top electrode is spaced further from said substrate than said top mirror is spaced from said substrate.

10 6. A tunable laser according to claim 4 wherein the top surface of said bottom mirror is located further from said substrate than the top surface of said bottom electrode.

15 7. A tunable Fabry-Perot filter comprising:
a bottom mirror mounted to the top of a substrate;
a bottom electrode mounted to the top of said bottom mirror;

20 a thin membrane support atop said bottom electrode;

 a top electrode fixed to the underside of said thin membrane support;

a reinforcer fixed to the outside perimeter of
said thin membrane support; and

a confocal top mirror set atop said thin membrane
support, with an air cavity being formed between said
bottom mirror and said top mirror;

wherein said top electrode and said bottom
electrode extend toward one another.

8. A tunable Fabry-Perot filter according to
claim 7 wherein said top electrode and said bottom
electrode are interdigitated.

9. A tunable Fabry-Perot filter according to
claim 8 wherein said top electrode and said bottom
electrode comprise concentric circles.

10. A tunable Fabry-Perot filter according to
claim 8 wherein said top electrode and said bottom
electrode comprises parallel plates.

11. A tunable Fabry-Perot filter according to
claim 8 wherein said top electrode and said bottom
electrode comprise a plurality of interspaced posts.

12. A tunable laser comprising:

a bottom mirror mounted to the top of a substrate;

a gain region mounted to the top of said bottom

5 mirror;

a bottom electrode mounted to the top of said gain region;

a thin membrane support atop said bottom electrode;

10 a top electrode fixed to the underside of said thin membrane support;

a reinforcer fixed to the outside perimeter of said thin membrane support; and

15 a confocal top mirror set atop said thin membrane support, with an air cavity being formed between said bottom mirror and said top mirror,

wherein said top electrode and said bottom electrode extend toward another.

20 13. A tunable VCSEL according to claim 12 wherein said top electrode and said bottom electrode are interdigitated.

14. A tunable VCSEL according to claim 13 wherein said top electrode and said bottom electrode comprise concentric circles.

5 15. A tunable VCSEL according to claim 13 wherein said top electrode and said bottom electrode comprises parallel plates.

10 16. A tunable VCSEL according to claim 13 wherein said top electrode and said bottom electrode comprise a plurality of interspaced posts.